

WE CLAIM

1. A method comprising:
exposing a plastic colored article to radiation in the near infrared
5 range; measuring radiation returned from or passed through said article and
analyzing said returned or passed radiation to provide defect data for said
article or contents within said article.
2. The method of claim 1 wherein said near infrared range is
between about 700 nm and about 2000 nm.
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3. The method of claim 1 wherein said near infrared range is
between about 700 nm to about 1100nm.
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4. The method of claim 1 where said defect data comprises data
selected from the group consisting of haze, unmelts, bubbles, voids,
specks, particulates, termination of internal layers in a multilayer structure,
holes of internal layers in a multilayer structure, content fill level and foreign
objects in contents.
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5. The method of claim 1 wherein said measuring step is
performed by an electronic camera.
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6. The method of claim 1 further comprising the step of using
said defect data to control or adjust process conditions for forming said
article.
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7. The method of claim 1 further comprising the step of using
said defect data to reject articles having unacceptable levels of defects
therein.
8. The method of claim 1 wherein said radiation is pulsed to
provide spatially undistorted data.
9. The method of claim 1 wherein said plastic is selected from
the group consisting of include polyesters, polyolefins, nylons, polystyrenes,
polycarbonates, ethylene-vinyl acetate copolymer (EVOH), polyalcohol
ethers, wholly aromatic polyesters, resorcinol diacetic acid-based

copolyesters, polyalcohol amines, isophthalate containing polyesters, PEN and its copolymers, mixtures, copolymers and multilayers thereof.

10. The method of claim 9 wherein said plastic comprises at least one polyester.

5 11. The method of claim 1 wherein said article is selected from the group consisting of polymer pellets, reactor strands, reactor contents, parisons, performs, bottles, containers, film, sheet, fibers, thermoformed articles, injection molded parts, extruded profiles, pipe and container contents.

10 12. The method of claim 11 wherein said article is selected from the group consisting of preforms, containers, bottles and container contents.

13. The method of claim 11 wherein said article is selected from the group consisting of preforms and containers.

15 14. The method of claim 11 wherein said article comprises container contents selected from the group consisting of colas, teas, coffee, motor oil, jellies, soy sauce.

20 15. The method of claim 1 wherein said colored article transmits less than about 25% of light across the range of about 400 nm to about 700 nm

25 16. An apparatus comprising;
a near infrared radiation source positioned to emit radiation at a colored article; and
a detector positioned to measure radiation returned from or passed through said colored article.

17. The apparatus of claim 16 further comprising a processing unit capable of providing an image or process control data.

18. The apparatus of claim 16 wherein said radiation source is selected from the group consisting of incandescent lamps, quartz lamps,

halogen lamps, arc lamps, metal oxide lamps, light emitting diodes and lasers.

19. The apparatus of claim 16 wherein said radiation source emits radiation between about 700 nm to about 2000 nm.

5 20. The apparatus of claim 16 wherein said radiation source emits radiation between about and preferably from about 700 nm to about 1100nm.

10 21. The apparatus of claim 16 wherein said detectors is selected from the group consisting of electronic photodetectors, thermal detectors, linear detector arrays and electronic cameras with wavelength sensitivity in the near infrared.

22. The apparatus of claim 16 further comprising optical filters that block visible wavelengths but transmits near infrared wavelengths and are used with the radiation source, detector or both.

15 23. The apparatus of claim 17 wherein said process control data is used to control a process for forming or handling said article.

20 24. A method comprising:
 exposing a plastic article having colored contents contained therein to radiation in the near infrared range; measuring radiation returned from or passed through said article and contents and analyzing said returned or passed radiation to provide defect data for said article or contents within said article.